## Initial Evaluation Procedure (IEP) Assessment                           Page 1

**WARNING!!** *This initial evaluation has been carried out solely as an initial seismic assessment of the building following the procedure set out in the New Zealand Society for Earthquake Engineering document "Assessment and Improvement of the Structural Performance of Buildings in Earthquakes, June 2006". This spreadsheet must be read in conjunction with the limitations set out in the accompanying report, and should not be relied on by any party for any other purpose. Detailed inspections and engineering calculations, or engineering judgements based on them, have not been undertaken, and these may lead to a different result orseismic grade.*

| | | | |
|---|---|---|---|
| **Street Number & Name:** | 55 Coote Road | **Job No.:** | 2-63649.00 |
| **AKA:** | Napier Prison | **By:** | [ s 9(2)(a) ] |
| **Name of building:** | Building 4 - Main Prison Block | **Date:** | 7/06/2016 |
| **City:** | Napier | **Revision No.:** | 0 |

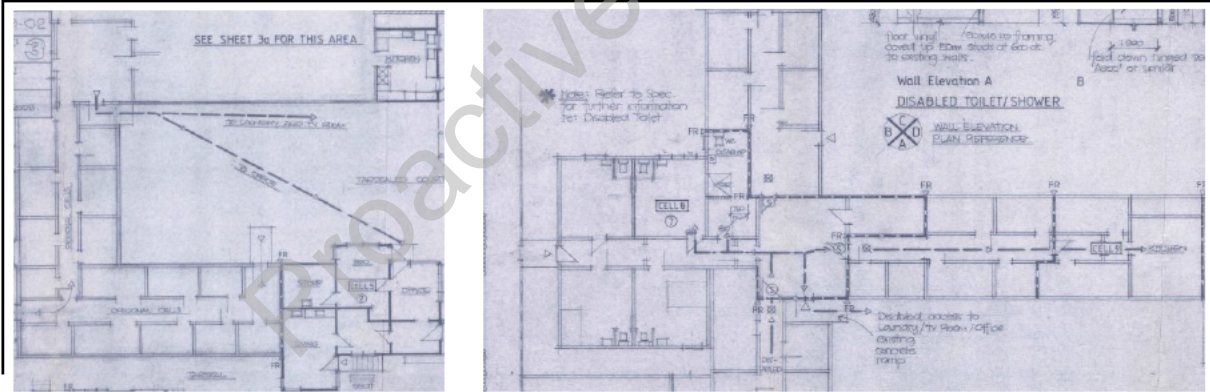### Table IEP-1    Initial Evaluation Procedure Step 1

### Step 1 - General Information

#### 1.1 Photos  (attach sufficient to describe building)



NOTE: THERE ARE MORE PHOTOS ON PAGE 1a ATTACHED

#### 1.2 Sketches (plans etc, show items of interest)



NOTE: THERE ARE MORE SKETCHES ON PAGE 1a ATTACHED

#### 1.3 List relevant features (Note: only 10 lines of text will print in this box. If further text required use Page 1a)

Built: 1862
Use: Former prison block. Now used as a tourist attraction with some cells used as private rooms for staff.
Structural bracing system:  Timber framed structure in both the longitudinal and transverse direction.
Roof: Iron sheet roofing panels on timber purlins.
Foundation system: Suspended timber floors on piles (assumed to be concrete).
Structure is lined with timber sarking internally and timber strip panel lining externally.

#### 1.4 Note information sources          Tick as appropriate

| | | | |
|---|---|---|---|
| **Visual Inspection of Exterior** | ☑ | **Specifications** | ☐ |
| **Visual Inspection of Interior** | ☑ | **Geotechnical Reports** | ☐ |
| **Drawings  (note type)** | ☑ | **Other  (list)** | ☐ |

Plan layouts from local council archives.

**Initial Evaluation Procedure (IEP) Assessment**               **Page 2**

| | | | |
|---|---|---|---|
| **Street Number & Name:** | 55 Coote Road | **Job No.:** | 2-63649.00 |
| **AKA:** | Napier Prison | **By:** | [ s 9(2)(a) ] |
| **Name of building:** | Building 4 - Main Prison Block | **Date:** | 7/06/2016 |
| **City:** | Napier | **Revision No.:** | 0 |

**Table IEP-2    Initial Evaluation Procedure Step 2**

**Step 2 - Determination of (%NBS)$_b$**
(Baseline *(%NBS)* for particular building - refer Section B5 )
**2.1 Determine nominal (%NBS) = (%NBS)$_{nom}$**

| | **Longitudinal** | **Transverse** |
|---|---|---|

**a)  Building Strengthening Data**

Tick if building is known to have been strengthened in this direction    ☐    ☐

If strengthened, enter percentage of code the building has been strengthened to    N/A    N/A

**b) Year of Design/Strengthening, Building Type and Seismic Zone**

| | Longitudinal | Transverse |
|---|---|---|
| Pre 1935 | ◉ | ◉ |
| 1935-1965 | ○ | ○ |
| 1965-1976 | ○ | ○ |
| 1976-1984 | ○ | ○ |
| 1984-1992 | ○ | ○ |
| 1992-2004 | ○ | ○ |
| 2004-2011 | ○ | ○ |
| Post Aug 2011 | ○ | ○ |

**Building Type:**   Public Buildings    Public Buildings

**Seismic Zone:**

**c)  Soil Type**

From NZS1170.5:2004, Cl 3.1.3 :    D Soft Soil    D Soft Soil

From NZS4203:1992, Cl 4.6.2.2 :    Flexible    Flexible
(for 1992 to 2004 and only if known)

**d)  Estimate Period, $T$**

*Comment:*      $h_n$ =   4.2    4.2   m
           $A_c$ =   1.00    1.00   m²

| | | Long. | Trans. |
|---|---|---|---|
| Moment Resisting Concrete Frames: | $T = \max\{0.09 h_n^{0.75}, 0.4\}$ | ○ | ○ |
| Moment Resisting Steel Frames: | $T = \max\{0.14 h_n^{0.75}, 0.4\}$ | ○ | ○ |
| Eccentrically Braced Steel Frames: | $T = \max\{0.08 h_n^{0.75}, 0.4\}$ | ○ | ○ |
| All Other Frame Structures: | $T = \max\{0.06 h_n^{0.75}, 0.4\}$ | ◉ | ◉ |
| Concrete Shear Walls | $T = \max\{0.09 h_n^{0.75}/ A_c^{0.5}, 0.4\}$ | ○ | ○ |
| Masonry Shear Walls: | $T \leq 0.4\text{sec}$ | ○ | ○ |
| User Defined (input Period): | | ○ | ○ |

*Where  $h_n$ = height in metres from the base of the structure to the
uppermost seismic weight or mass.*

       T:   0.40    0.40

**e) Factor A:**   Strengthening factor determined using result from (a) above (set to 1.0 if not strengthened)    **Factor A:** 1.00    1.00

**f)  Factor B:**   Determined from NZSEE Guidelines Figure 3A.1 using results (a) to (e) above    **Factor B:** 0.03    0.03

**g) Factor C:**   For reinforced concrete buildings designed between 1976-84 Factor C = 1.2, otherwise  take as 1.0.    **Factor C:** 1.00    1.00

**h) Factor D:**   For buildings designed prior to 1935 Factor D = 0.8 except for Wellington where Factor D may be taken as 1, otherwise take as 1.0.    **Factor D:** 0.80    0.80

**(%NBS)$_{nom}$ = AxBxCxD**      **(%NBS)$_{nom}$**   2%    2%

---

**WARNING!!** *This initial evaluation has been carried out solely as an initial seismic assessment of the building following the procedure set out in the New Zealand Society for Earthquake Engineering document "Assessment and Improvement of the Structural Performance of Buildings in  Earthquakes, June 2006".  This spreadsheet must be read in conjunction with the limitations set out in the accompanying report, and should not be relied on by any party for any other purpose.  Detailed inspections and engineering calculations, or engineering judgements based on them, have not been undertaken, and these may lead to a different result or seismic grade.*

## Initial Evaluation Procedure (IEP) Assessment                                    Page 3

| Street Number & Name: | 55 Coote Road | Job No.: | 2-63649.00 |
|---|---|---|---|
| AKA: | Napier Prison | By: | [ s 9(2)(a) ] |
| Name of building: | Building 4 - Main Prison Block | Date: | 7/06/2016 |
| City: | Napier | Revision No.: | 0 |

### Table IEP-2    Initial Evaluation Procedure Step 2 continued

**2.2 Near Fault Scaling Factor, Factor E**
**If $T \leq 1.5sec$, Factor E = 1**

|  |  | **Longitudinal** | **Transverse** |
|---|---|---|---|
| a) Near Fault Factor, $N(T,D)$ | $N(T,D)$: | 1 | 1 |
| (from NZS1170.5:2004, Cl 3.1.6) | | | |
| b) Factor E          $= 1/N(T,D)$ | Factor E: | 1.00 | 1.00 |

**2.3 Hazard Scaling Factor, Factor F**
a) Hazard Factor, $Z$, for site

Location:    Napier

| | | |
|---|---|---|
| $Z =$ | 0.38 | (from NZS1170.5:2004, Table 3.3) |
| $Z_{1992} =$ | 1.2 | (NZS4203:1992 Zone Factor from accompanying Figure 3.5(b)) |
| $Z_{2004} =$ | 0.38 | (from NZS1170.5:2004, Table 3.3) |

b) Factor F
| | | |
|---|---|---|
| For pre 1992 | $=$ | $1/Z$ |
| For 1992-2011 | $=$ | $Z_{1992}/Z$ |
| For post 2011 | $=$ | $Z_{2004}/Z$ |

| | | **Longitudinal** | **Transverse** |
|---|---|---|---|
| | Factor F: | 2.63 | 2.63 |

**2.4 Return Period Scaling Factor, Factor G**
a) Design Importance Level, I
(Set to 1 if not known. For buildings designed prior to 1965 and known to be designed as a public building set to 1.25. For buildings designed 1965-1976 and known to be designed as a public building set to 1.33 for Zone A or 1.2 for Zone B. For 1976-1984 set I value.)

| | | **Longitudinal** | **Transverse** |
|---|---|---|---|
| | I = | 1.25 | 1.25 |

b) Design Risk Factor, $R_o$
(set to 1.0 if other than 1976-2004, or not known)

| | | **Longitudinal** | **Transverse** |
|---|---|---|---|
| | $R_o =$ | 1 | 1 |

c) Return Period Factor, R
(from NZS1170.0:2004 Building Importance Level)    *Choose Importance Level*    ○1 ◉2 ○3 ○4          ○1 ◉2 ○3 ○4

| | | **Longitudinal** | **Transverse** |
|---|---|---|---|
| | R = | 1.0 | 1.0 |

d) Factor G          $= IR_o/R$

| | | **Longitudinal** | **Transverse** |
|---|---|---|---|
| | Factor G: | 1.25 | 1.25 |

**2.5 Ductility Scaling Factor, Factor H**
a) Available Displacement Ductility Within Existing Structure
*Comment:*

| | | **Longitudinal** | **Transverse** |
|---|---|---|---|
| | $\mu =$ | 2.00 | 2.00 |

b) Factor H
| | | $k_\mu$ | $k_\mu$ |
|---|---|---|---|
| For pre 1976 (maximum of 2) | $=$ | 1.57 | 1.57 |
| For 1976 onwards | $=$ | 1 | 1 |
| | Factor H: | 1.57 | 1.57 |

(where kµ is NZS1170.5:2004 Inelastic Spectrum Scaling Factor, from accompanying Table 3.3)

**2.6 Structural Performance Scaling Factor, Factor I**
a) Structural Performance Factor, $S_p$
(from accompanying Figure 3.4)
Tick if light timber-framed construction in this direction

| | | **Longitudinal** | **Transverse** |
|---|---|---|---|
| | | ☑ | ☑ |
| | $S_p =$ | 0.50 | 0.50 |

b) Structural Performance Scaling Factor          $= 1/S_p$

| | | **Longitudinal** | **Transverse** |
|---|---|---|---|
| | Factor I: | 2.00 | 2.00 |

Note Factor B values for 1992 to 2004 have been multiplied by 0.67 to account for Sp in this period

**2.7 Baseline %NBS for Building, $(\%NBS)_b$**
(equals $(\%NBS)_{nom}$ x E x F x G x H x I )

| | **Longitudinal** | **Transverse** |
|---|---|---|
| | 24% | 24% |

| Initial Evaluation Procedure (IEP) Assessment | | Page 4 |
|---|---|---|

| Street Number & Name: | 55 Coote Road | Job No.: | 2-63649.00 |
|---|---|---|---|
| AKA: | Napier Prison | By: | [ s 9(2)(a) ] |
| Name of building: | Building 4 - Main Prison Block | Date: | 7/06/2016 |
| City: | Napier | Revision No.: | 0 |

## Table IEP-3    Initial Evaluation Procedure Step 3

### Step 3 - Assessment of Performance Achievement Ratio (PAR)
*(Refer Appendix B - Section B3.2)*

### a) Longitudinal Direction

| potential CSWs | Effect on Structural Performance<br>(Choose a value - Do not interpolate) | | | Factors |
|---|---|---|---|---|

**3.1 Plan Irregularity**

Effect on Structural Performance  ○ Severe          ○ Significant          ⦿ Insignificant     **Factor A**  `1.0`
None

**3.2 Vertical Irregularity**

Effect on Structural Performance  ○ Severe          ○ Significant          ⦿ Insignificant     **Factor B**  `1.0`
None

**3.3 Short Columns**

Effect on Structural Performance  ○ Severe          ○ Significant          ⦿ Insignificant     **Factor C**  `1.0`
None

**3.4 Pounding Potential**
*(Estimate D1 and D2 and set D = the lower of the two, or 1.0 if no potential for pounding, or consequences are considered to be minimal)*

**a) Factor D1: - Pounding Effect**

> **Note:**
> *Values given assume the building has a frame structure. For stiff buildings (eg shear walls), the effect of pounding may be reduced by taking the coefficient to the right of the value applicable to frame buildings.*

**Factor D1 For Longitudinal Direction:**  `1.0`

| Table for Selection of Factor D1 | Severe<br>0<Sep<.005H | Significant<br>.005<Sep<.01H | Insignificant<br>Sep>.01H |
|---|---|---|---|
| Separation | | | |
| Alignment of Floors within 20% of Storey Height | ○ 1 | ○ 1 | ⦿ 1 |
| Alignment of Floors not within 20% of Storey Height | ○ 0.4 | ○ 0.7 | ○ 0.8 |

None

**b) Factor D2: - Height Difference Effect**

**Factor D2 For Longitudinal Direction:**  `1.0`

| Table for Selection of Factor D2 | Severe<br>0<Sep<.005H | Significant<br>.005<Sep<.01H | Insignificant<br>Sep>.01H |
|---|---|---|---|
| Height Difference > 4 Storeys | ○ 0.4 | ○ 0.7 | ○ 1 |
| Height Difference 2 to 4 Storeys | ○ 0.7 | ○ 0.9 | ○ 1 |
| Height Difference < 2 Storeys | ○ 1 | ○ 1 | ⦿ 1 |

None

**Factor D**  `1.0`

**3.5 Site Characteristics -** *Stability, landslide threat, liquefaction etc as it affects the structural performance from a life-safety perspective*

Effect on Structural Performance  ○ Severe          ○ Significant          ⦿ Insignificant     **Factor E**  `1.0`
None

**3.6 Other Factors -** *for allowance of all other relevant characterstics of the building*      For ≤ 3 storeys - Maximum value 2.5   **Factor F**  `2.5`
                                                                                  otherwise  - Maximum value 1.5.
**Record rationale for choice of Factor F:**                                                        No minimum.
Lightweight building, numerous closely spaced walls

**PAR**

| 3.7 Performance Achievement Ratio (PAR)<br>(equals A x B x C x D x E x F ) | **Longitudinal** | 2.50 |
|---|---|---|

Proactive Release

## Initial Evaluation Procedure (IEP) Assessment | Page 5

| Street Number & Name: | 55 Coote Road | Job No.: | 2-63649.00 |
|---|---|---|---|
| AKA: | Napier Prison | By: | [ s 9(2)(a) ] |
| Name of building: | Building 4 - Main Prison Block | Date: | 7/06/2016 |
| City: | Napier | Revision No.: | 0 |

### Table IEP-3    Initial Evaluation Procedure Step 3

**Step 3 - Assessment of Performance Achievement Ratio (PAR)**
*(Refer Appendix B - Section B3.2)*

**b) Transverse Direction**

|   | **potential CSWs** | **Effect on Structural Performance**<br>*(Choose a value - Do not interpolate)* |   |   | **Factors** |
|---|---|---|---|---|---|

**3.1 Plan Irregularity**
*Effect on Structural Performance*   ☐ Severe   ☐ Significant   ◉ Insignificant   **Factor A** `1.0`
None

**3.2 Vertical Irregularity**
*Effect on Structural Performance*   ☐ Severe   ☐ Significant   ◉ Insignificant   **Factor B** `1.0`
None

**3.3 Short Columns**
*Effect on Structural Performance*   ☐ Severe   ☐ Significant   ◉ Insignificant   **Factor C** `1.0`
None

**3.4 Pounding Potential**
*(Estimate D1 and D2 and set D = the lower of the two, or 1.0 if no potential for pounding, or consequences are considered to be minimal)*

**a) Factor D1: - Pounding Effect**

> **Note:**
> *Values given assume the building has a frame structure. For stiff buildings (eg shear walls), the effect of pounding may be reduced by taking the coefficient to the right of the value applicable to frame buildings.*

**Factor D1 For Transverse Direction:** `1.0`

| Table for Selection of Factor D1 | Severe<br>0<Sep<.005H | Significant<br>.005<Sep<.01H | Insignificant<br>Sep>.01H |
|---|---|---|---|
| Separation | | | |
| Alignment of Floors within 20% of Storey Height | ☐ 1 | ☐ 1 | ◉ 1 |
| Alignment of Floors not within 20% of Storey Height | ☐ 0.4 | ☐ 0.7 | ☐ 0.8 |

None

**b) Factor D2: - Height Difference Effect**

**Factor D2 For Transverse Direction:** `1.0`

| Table for Selection of Factor D2 | Severe<br>0<Sep<.005H | Significant<br>.005<Sep<.01H | Insignificant<br>Sep>.01H |
|---|---|---|---|
| Height Difference > 4 Storeys | ☐ 0.4 | ☐ 0.7 | ☐ 1 |
| Height Difference 2 to 4 Storeys | ☐ 0.7 | ☐ 0.9 | ☐ 1 |
| Height Difference < 2 Storeys | ☐ 1 | ☐ 1 | ◉ 1 |

None

**Factor D** `1.0`

**3.5 Site Characteristics -** *Stability, landslide threat, liquefaction etc as it affects the structural performance from a life-safety perspective*

*Effect on Structural Performance*   ☐ Severe   ☐ Significant   ◉ Insignificant   **Factor E** `1.0`
None

**3.6 Other Factors -** *for allowance of all other relevant characterstics of the building*

For ≤ 3 storeys - Maximum value 2.5
otherwise - Maximum value 1.5.
No minimum.

**Factor F** `2.50`

**Record rationale for choice of Factor F:**
Lightweight building, numerous closely spaced walls

**3.7 Performance Achievement Ratio (PAR)**
(equals A x B x C x D x E x F )

**PAR**
**Transverse** `2.50`

> **WARNING!!** *This initial evaluation has been carried out solely as an initial seismic assessment of the building following the procedure set out in the New Zealand Society for Earthquake Engineering document "Assessment and Improvement of the Structural Performance of Buildings in Earthquakes, June 2006". This spreadsheet must be read in conjunction with the limitations set out in the accompanying report, and should not be relied on by any party for any other purpose. Detailed inspections and engineering calculations, or engineering judgements based on them, have not been undertaken, and these may lead to a different result or seismic grade.*

## Initial Evaluation Procedure (IEP) Assessment                                  **Page 6**

| | | | |
|---|---|---|---|
| **Street Number & Name:** | 55 Coote Road | **Job No.:** | 2-63649.00 |
| **AKA:** | Napier Prison | **By:** | [ s 9(2)(a) ] |
| **Name of building:** | Building 4 - Main Prison Block | **Date:** | 7/06/2016 |
| **City:** | Napier | **Revision No.:** | 0 |

### Table IEP-4    Initial Evaluation Procedure Steps 4, 5, 6 and 7

**Step 4 - Percentage of New Building Standard (%NBS)**

| | | Longitudinal | Transverse |
|---|---|---|---|
| 4.1 | **Assessed Baseline %NBS (%NBS)$_b$** (from Table IEP - 1) | 24% | 24% |
| 4.2 | **Performance Achievement Ratio (PAR)** (from Table IEP - 2) | 2.50 | 2.50 |
| 4.3 | **PAR x Baseline (%NBS)$_b$** | 60% | 60% |
| 4.4 | **Percentage New Building Standard (%NBS)** ( Use lower of two values from Step 4.3) | | 60% |

**Step 5 - Potentially Earthquake Prone?**
(Mark as appropriate)                                      %NBS $\leq$ 34        NO

**Step 6 - Potentially Earthquake Risk?**
(Mark as appropriate)                                      %NBS < 67        YES

**Step 7 - Provisional Grading for Seismic Risk based on IEP**

Seismic Grade        C

**Additional Comments (items of note affecting IEP score)**

[ s 9(2)(a) ]

**Evaluation Confirmed by** ▮▮▮▮▮▮▮▮ **Signature**

▮▮▮▮▮▮▮▮ **Name**

1003026 **CPEng. No**

**Relationship between Grade and %NBS :**

| Grade: | A+ | A | B | C | D | E |
|---|---|---|---|---|---|---|
| %NBS: | > 100 | 100 to 80 | 79 to 67 | 66 to 34 | 33 to 20 | < 20 |

**WARNING!!** *This initial evaluation has been carried out solely as an initial seismic assessment of the building following the procedure set out in the New Zealand Society for Earthquake Engineering document "Assessment and Improvement of the Structural Performance of Buildings in Earthquakes, June 2006". This spreadsheet must be read in conjunction with the limitations set out in the accompanying report, and should not be relied on by any party for any other purpose. Detailed inspections and engineering calculations, or engineering judgements based on them, have not been undertaken, and these may lead to a different result or seismic grade.*

## Initial Evaluation Procedure (IEP) Assessment | Page 7

| Street Number & Name: | 55 Coote Road | Job No.: | 2-63649.00 |
|---|---|---|---|
| AKA: | Napier Prison | By: | [ s 9(2)(a) ] |
| Name of building: | Building 4 - Main Prison Block | Date: | 7/06/2016 |
| City: | Napier | Revision No.: | 0 |

**Table IEP-5    Initial Evaluation Procedure Step 8**

Step 8 - Identification of potential Severe Critical Structural Weaknesses that could result in significant risk to a significant number of occupants

8.1    Number of storeys above ground level                    `1`

8.2    Presence of heavy concrete floors and/or concrete roof? (Y/N)    `N`

   Occupancy not considered to be significant - no further consideration required

   Risk not considered to be significant - no further consideration required

Proactive Release

## Initial Evaluation Procedure (IEP) Assessment                                    Page 1a

| | | | |
|---|---|---|---|
| **Street Number & Name:** | 55 Coote Road | **Job No.:** | 2-63649.00 |
| **AKA:** | Napier Prison | **By:** | [ s 9(2)(a) ] |
| **Name of building:** | Building 4 - Main Prison Block | **Date:** | 7/06/2016 |
| **City:** | Napier | **Revision No.:** | 0 |

### Table IEP-1a     Additional Photos and Sketches

**Add any additional photographs, notes or sketches required below:**

*Note: print this page separately*